



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,370	08/19/2003	James G. Droppo	M61.12-0522	4847

27366 7590 10/18/2007  
WESTMAN CHAMPLIN (MICROSOFT CORPORATION)  
SUITE 1400  
900 SECOND AVENUE SOUTH  
MINNEAPOLIS, MN 55402-3319

EXAMINER
----------

ALBERTALLI, BRIAN LOUIS

ART UNIT	PAPER NUMBER
----------	--------------

2626

MAIL DATE	DELIVERY MODE
-----------	---------------

10/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/643,370	<b>Applicant(s)</b> DROPO ET AL.	
	<b>Examiner</b> Brian L. Albertalli	<b>Art Unit</b> 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 and 24 is/are allowed.
- 6) ☒ Claim(s) 11-15 and 19-23 is/are rejected.
- 7) ☒ Claim(s) 16-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

#### **A. 35 U.S.C. 101 Rejections**

Applicant's arguments regarding claims 11-23 are persuasive. Specifically, since "computer storage media" are defined by the specification as statutory type computer readable media (e.g. CD-ROMs, etc.) and distinct from "communication media" (e.g. carrier waves), the rejections under 35 U.S.C. 101 are withdrawn. Additionally, newly added claim 24 is directed to "statutory computer storage media" and does not raise issues with respect to 35 U.S.C. 101.

#### **B. Claims 1-10 and 24**

Claim 1 has been amended to incorporate the subject matter of claim 6 which, as indicated in the previous Office Action, is allowable subject matter. Thus, claims 1-10 are allowed. In addition, claim 24 contains similar subject matter to currently amended claim 1 and is thus allowed for the same reasons.

#### **C. Claims 11-23**

Applicant's arguments with respect to claims 11-23 have been fully considered but they are not persuasive.

Independent claim 11 has been amended herein to require determining a mean for a distribution of the signal-to-noise ratio function and using the mean to determine an estimate of a value for the signal-to-noise ratio variable for a frame of an observed

Art Unit: 2626

signal. Applicant argues that Accardi et al. do not disclose determining a mean for a distribution of the signal-to-noise ratio function.

However, Accardi et al. disclose the a-priori SNR (signal-to-noise ratio) by determining an expected value for the distribution of the a priori SNR (page 2, equation 15 and paragraph 19). An expected value of a random variable is equivalent to the mean of the random variable. Subsequently, the mean is used (i.e. equation 15) to determine an estimate of the a-priori SNR for a particular frame of an observed signal (page 2, paragraphs 20-21). Thus, Accardi et al. disclose the steps of determining a mean for a distribution of the signal-to-noise ratio function and using the mean to determine an estimate of a value for the signal-to-noise ratio variable for a frame of an observed signal, as required by claim 11. Accordingly, the rejection of claim 11 under 35 U.S.C. 102(b) is maintained.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11-15 and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Accardi et al. (U.S. Patent Application Publication 2002/0002455).

In regard to claim 11, Accardi et al. disclose a computer-readable storage medium storing computer-executable instructions for performing steps comprising:

defining a random variable as a function of a signal-to-noise ratio variable (a clean speech random variable  $X$  is defined as a function of a estimated amplitude  $A$ , which is further defined as a function of a signal to noise ratio variable, page 2, equations 7, 8, 11, and 12, and paragraphs 14 and 18; additionally, equation 8 defines  $R$ , determined from noise, as a function of a signal to noise ratio variable);

determining a mean for a distribution of the signal-to-noise ratio variable based on the defined function (determining an expected value for the distribution of the a priori SNR, page 2, equation 15 and paragraph 19); and

using the mean to determine an estimate of a value for the signal-to-noise ratio variable for a frame of the observed signal (the mean is used to determine an estimate of the a-priori SNR for a particular frame of an observed signal, page 2, paragraphs 20-21).

In regard to claim 12, Accardi et al. disclose the random variable comprises a clean signal random variable representing a portion of a clean signal ( $X$  is a random variable representing clean speech, page 2, paragraph 14).

In regard to claim 13, Accardi et al. disclose the random variable comprises a noise signal random variable representing a noise in an observed signal ( $R$  represents noise observed in a signal, page 2, paragraph 19).

In regard to claim 14, Accardi et al. disclose defining a random variable further comprises defining the random variable as a function of an observed value (the estimated amplitude depends on  $R$ , see equation 8, which is determined from the observed noisy speech, page 2, paragraph 19).

In regard to claim 15, Accardi et al. disclose determining a mean further comprises approximating at least a portion of the defined function with an approximation function (the a-priori SNR is estimated by equation 16, page 2, paragraphs 19 and 20).

In regard to claims 19 and 20, Accardi et al. disclose using the mean to determine an estimate of the random variable, where the random variable is a clean signal random variable representing a portion of the clean signal (equations 13 and 14 are used to determine the estimated amplitude, which is used to determine the estimated clean signal random variable  $X$ , page 2, paragraph 14 and equation 7).

In regard to claim 21, Accardi et al. disclose determining a mean further comprises determining the mean based on a model parameter that describes a distribution of clean signal values, each clean signal value representing a portion of a clean signal (expected value of the clean speech, page 2, paragraph 18 and equation 13).

In regard to claim 22, Accardi et al. disclose determining a mean further comprises determining the mean based on a model parameter that describes a distribution of noise values (expected value of the noise, page 2, paragraph 18 and equation 14).

In regard to claim 23, Accardi et al. disclose determining the mean from an observed signal (the estimated amplitude depends on  $R$ , see equation 8, which is determined from the observed noisy speech, page 2, paragraph 19).

***Allowable Subject Matter***

Claims 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claim 16 requires approximating a function of the mapping random variable using a Taylor series expansion. Accardi et al. provide no mention of a Taylor series expansion. Furthermore, while the Taylor series expansion is well known, it is not readily apparent (i.e. obvious) how Accardi et al. could be modified to incorporate a Taylor series expansion to approximate a function of the mapping random variable.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Albertalli whose telephone number is (571) 272-7616. The examiner can normally be reached on Mon - Fri, 8:00 AM - 5:30 PM, every second Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2626

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BLA 10/4/07



**DAVID HUDSPETH**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER**